HP StorageWorks
700ux/1100ux Optical Jukebox

This guide describes procedures for removing and replacing FRUs, and troubleshooting the HP StorageWorks 700ux/1100ux Optical Jukebox.

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Contents

About this Guide

This service manual provides information to help you:

■ Troubleshoot the jukebox.

■ Remove and replace Field Replaceable Units (FRUs).

"About this Guide" topics include:

Related documentation

In addition to this guide, HP provides corresponding information for the 700ux/1100ux Optical Jukebox:

■   The *HP StorageWorks 700ux/1100ux Optical Jukebox Getting Started Poster* provides an installation overview.

■   The *HP StorageWorks 700ux/1100ux Optical Jukebox Setup Guide* provides detailed information on installing the jukebox.

■   The *HP StorageWorks 700ux/1100ux Optical Jukebox Users Guide* provides information on operating the jukebox.

Conventions

Conventions consist of the following:

- Document conventions
- Text symbols
- Equipment symbols

Document conventions

This document follows the conventions in Table 1.

Table 1: Document conventions

Convention	Element
Blue text: Figure 1	Cross-reference links
Bold	Menu items, buttons, and key, tab, and box names
Italics	Text emphasis and document titles in body text
`Monospace font`	User input, commands, code, file and directory names, and system responses (output and messages)
`Monospace, italic font`	Command-line and code variables
Blue underlined sans serif font text (http://www.hp.com)	Web site addresses

Text symbols

The following symbols may be found in the text of this guide. They have the following meanings:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Tip: Text in a tip provides additional help to readers by providing nonessential or optional techniques, procedures, or shortcuts.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Equipment symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings:

Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.

Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.
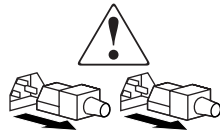
Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

Getting help

If you still have a question after reading this guide, contact an HP authorized service provider or access one of the following web sites:

■ http://www.hp.com

■ http://www.hp.com/go/udo

HP technical support

Telephone numbers for worldwide technical support are listed on the following HP web site: http://www.hp.com/support/. From this web site, select the country of origin.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

■ Technical support registration number (if applicable)

■ Product serial numbers

■ Product model names and numbers

■ Applicable error messages

■ Operating system type and revision level

■ Detailed, specific questions

HP storage web site

The HP web site has the latest information on this product, as well as the latest drivers. Access storage at: http://www.hp.com/country/us/eng/prodserv/storage.html. From this web site, select the appropriate product or solution.

HP authorized reseller

For the name of your nearest HP authorized reseller:

■ In the United States, call 1-800-345-1518

■ In Canada, call 1-800-263-5868

■ Elsewhere, see the HP web site for locations and telephone numbers: http://www.hp.com.

Troubleshooting and Diagnostics

1

This chapter describes the following:

- Troubleshooting common problems, page 12
- Retrieving log history, page 18
- Running an internal test, page 20
- Using HP StorageWorks Library and Tape Tools, page 22

Troubleshooting common problems

If the procedures in Table 2 do not address or resolve your problem, use HP StorageWorks Library and Tape Tools (L&TT) to pull a support ticket. The support ticket might identify a specific problem and suggest a solution.

Table 2: Troubleshooting installation

Problem	Solution
Power Up and Detection	
Jukebox will not power on	■ Check that the power indicator light on the control panel is on. If it is not, verify that the power switch on the back panel is on. ■ Replace the power cord. ■ Replace the jukebox.
Host computer system does not recognize the jukebox or the drives	■ Ensure the jukebox is not in an error or failed state. If so, troubleshoot the error before continuing. ■ Ensure the jukebox is connected and powered on. The jukebox must be on and displaying READY when booting the host computer for the jukebox to be recognized. ■ Check that the SCSI bus has been terminated and that the maximum cable length has not been exceeded. ■ Check SCSI ID assignments and resolve any conflicts. ■ Ensure you are connected to the correct SCSI bus type. UDO jukeboxes are LVDS devices. ■ If using a narrow (8-bit) HBA, verify that all addresses are in the range 0 through 7. ■ For Windows operating systems, use the device manager to rediscover the jukebox. ■ For HP-UX, use ioscan to verify that the HBA and attached devices are claimed. ■ For other operating systems, refer to the system administrators guide for diagnosing missing peripherals. ■ Check that the application software is compatible with the jukebox. ■ Check that the device is present on the system using L&TT, available on http://www.hp.com/support/tapetools. ■ Power cycle the jukebox and power down the host. Wait until the jukebox completes its power cycle before powering up the host.

Table 2: Troubleshooting installation (Continued)

Problem	Solution
The power-on selftest failed and `DEVICE FAILED` is displayed	■ Ensure the two shipping screws on the left side of the jukebox have been removed. ■ Power cycle the jukebox. ■ Check for proper cable connections to the drive(s). ■ If the power-on test continues to fail, write down the displayed error code and a micro move error, then remove the top cover and check for cartridges that are out of position or other obstacles.
Power to the jukebox failed while a disk was in the drive and the display did not return to `READY` after the power came back on	■ Power cycle the jukebox. ■ If `READY` does not display (power-on test is unsuccessful), write down any error messages, then remove the top cover and check for cartridges that are out of position or other obstacles. ■ Check for proper cable connections to the drive(s). **Caution:** Do not move the unit! Moving the unit risks damaging the optical drive.
Other SCSI devices no longer work when the jukebox is installed	■ Check SCSI ID assignments and resolve any conflicts. ■ Ensure that the SCSI ID for the HBA is different from that of the jukebox. ■ Check for proper SCSI cabling and termination. ■ Ensure the maximum cable length for the bus has not been exceeded (12 meters for LVDS and 3 meters for SE).

Table 2: Troubleshooting installation (Continued)

Problem	Solution
Media	
A disk is stuck in a drive	■ Attempt to unload the disk using your application software. ■ Check for proper cable connections to the drive(s). ■ Disconnect power to the jukebox and open the top access panel. Press the eject button located below (to the right) of the disk slot. ■ If all other measures fail, use the emergency eject screw. — Disconnect power to the jukebox and open the top access panel. — On the drive with the stuck disk, insert a small, flat-slotted screwdriver into the access hole located below the disk slot on the front panel of the drive. The screwdriver will engage a screw behind the access hole. — With the screw engaged, apply force while turning the screw in a clockwise direction. — Continue turning the screw until the disk ejects from the drive. **Note:** After ejecting a disk with the emergency eject screw, the drive remains in eject position until power is restored. At that time, the drive automatically resets itself.
Cannot write to a disk	■ Check the host file system access permissions. ■ Eject the disk and check that the write-protect tab on each side of the disk is in the write-enabled position. ■ Use L&TT to verify read/write functionality. **Note:** Verifying read/write functionality with L&TT can destroy data on the disk. Use this method only if necessary.

Table 2: Troubleshooting installation (Continued)

Problem	Solution
Control Panel Messages	
No display messages appear	■ Ensure that the power cord is connected. ■ Ensure that the power switch is on. ■ Power cycle the jukebox.
`LOAD ERROR` or `FAILED` is displayed when a disk is inserted into the mailslot	■ Press **CANCEL**. Insert the disk into the mailslot again. ■ If the light bar on the control panel is amber, cycle power to the jukebox. When `READY` is displayed, try loading the disk again. ■ Ensure the cartridge is positioned correctly. ■ If the error still displays, the mailslot may be broken. Replace the jukebox.
`CART IN WRONG OR INCOMPATIBLE` is displayed when a disk is loaded.	An attempt was made to load an incompatible disk into the jukebox, or an incompatible disk was placed backwards into the mailslot. Ensure that you use UDO disks in UDO drives.
`MAILSLOT EMPTY` is displayed when a disk is inserted into the mailslot	■ Remove and then replace the disk fully into the mailslot. ■ If the same error reappears, the mailslot sensors are not detecting a disk and may be defective. Replace the jukebox.
`DEST NOW FULL` is displayed when a disk is inserted into the mailslot	The jukebox moved a disk into the slot you chose before your load command executed. ■ Press **CANCEL**, select another slot for the disk, and then reattempt a load. ■ Initiate an `INIT ELEM STATUS` test (see Internal tests, page 20).
`TRANSPORT FULL` is displayed when a disk is inserted into the mailslot	■ The disk transport mechanism already contains a disk. Refer to your host and application software documentation for recovery procedures. ■ Attempt an `EMPTY PICKER` test (see Internal tests, page 20).
`MAILSLOT SENSOR` is displayed when a disk is inserted into the mailslot	■ Remove and then replace the disk fully into the mailslot. ■ If unsuccessful, the jukebox mailslot sensors may have failed. Replace the jukebox.

Table 2: Troubleshooting installation (Continued)

Problem	Solution
`EJECT ERROR` is displayed when a disk eject is attempted	■ Press **CANCEL**. Attempt to eject the disk again. ■ If the LED on the control panel is amber, cycle power to the jukebox and try to eject the disk again when `READY` is displayed. ■ If there is no disk in the mailslot and this error message repeats, replace the jukebox.
`RESERVED` is displayed when a disk load or eject is attempted	The application software reserved the element or jukebox for its use or a security configuration was set to prevent disk ejection. Attempt the operation using your application software.
`EMPTY` is displayed when a disk eject is attempted	■ This is not an error. There are no disks in the jukebox. ■ If disks are present, run the `INIT ELEM STATUS` test from the front panel.
`TRANSPORT FULL` is displayed when a disk eject is attempted	■ The disk transport mechanism already contains a disk. Refer to your host and application software documentation for recovery procedures. ■ Attempt an `EMPTY PICKER` test (see Internal tests, page 20).
`SOURCE NOW EMPTY` is displayed when a disk eject is attempted	The application software moved the disk from the slot you chose before your eject command executed. ■ Press **CANCEL**. You may have to wait for the application software to replace the disk into the slot before attempting another eject. ■ Initiate an `INIT ELEM STATUS` test (see Internal tests, page 20).
`MAILSLOT FULL` is displayed when a disk eject is attempted	A disk is in the mailslot. To remove the disk, select `EJECT *`, select the slot that holds the disk, and eject the disk.

Table 2: Troubleshooting installation (Continued)

Problem	Solution
Administration	
Forgot the password	■ Enter the default password (000 000 000). ■ Clear the password (requires minimum firmware level 5.01). 1. If necessary, press **CANCEL** to get to the **READY** mode. 2. Hold down the **ENTER** button and press **PREV** and **NEXT** so that all three are pressed at the same time. 3. When **<<MAINTENANCE>> PASSWORD>>** displays, release the buttons. 4. Press **ENTER**, **ENTER**, **NEXT**. 5. Press **NEXT** or **PREV** to go to menu item `41: PASSWORD RESET`, then press **ENTER**. 6. Press **PREV**, **NEXT**, **ENTER**. 7. Press **CANCEL** until **ON LINE MODE?** displays. 8. Press **ENTER**.
You want to stop a test that is running	Press **CANCEL**. The current test loop continues until finished, then the test stops.

Retrieving log history

> **Note:** Whenever possible, use L&TT to retrieve log information. If that is not possible, use the jukebox control panel, as described below.

```
READY > ADMIN* > INFO*
```

To display information stored in the jukebox operating logs:

1. With `READY` displaying on the control panel, press **NEXT** until `ADMIN*` displays.

2. Enter the administration password (see the *User's Guide* if needed).

3. `TEST*` displays. Press **NEXT** until `INFO*` displays, then press `ENTER`.

4. Press **NEXT** until the name of the log you want to access displays and then press **ENTER**.

   Log items are numbered chronologically, with 1 being the most recent entry.

5. After you finish viewing log information, press **CANCEL** to return to `READY`.

Information logs are described in Table 3.

Table 3: Information logs

Information	Meaning
HARD ERROR*	Log of unrecoverable errors (commands that did not successfully complete). Returns either NO HARD ENTRIES or ENTRY #. (There may be multiple hard error numbers.) Press **ENTER** to view the log for the currently displayed error, or press **NEXT** to select the next error.
SOFT ERROR*	Log of recovered errors (commands that completed, but required retries). Returns either NO SOFT ENTRIES or ENTRY #. (There may be multiple soft error numbers.) Press **ENTER** to view the log for the currently displayed error, or press **NEXT** to select the next error.
RECOVERY ERROR*	Log of errors during the most recent move. Returns either NO ENTRIES or the number of recovery errors. Press **ENTER** to view the log for the currently displayed error, or press **NEXT** to select the next error.

Table 3: Information logs (Continued)

Information	Meaning
■ *HARDWARE ERR #	Internal diagnostics error number for the failure.
— MOTION <name>	<name> indicates one of the following types of movements taking place in the jukebox at the time of the failure: ■ EXCHANGE ■ MOVE ■ POSITION ■ INIT ELEM ■ REZERO ■ ROTATE ■ DIAGNOSTIC ■ RESTORE
— SOURCE #	SCSI element number to which the source refers. (This information is valid for MOVE, EXCHANGE, and POSITION movements only.) ■ Transport element (picker) is at element 0, and there is one. ■ Data Transfer Element(s) (drives) start at element 1, and there are either one or two. ■ Import/Export Element (mail slot) is at 20 and there is one. ■ Storage Elements (slots) start at 31 and there are 24 without a configuration module and 38 with a configuration module. Storage Elements are numbered starting at 1 when using the front panel; add 30 to get the SCSI element number.
— DESTINATION 1 #	SCSI element to which the first destination refers. (This information is valid for MOVE and EXCHANGE movements only.)
— DESTINATION 2 #	SCSI element to which the second destination refers. (This information is valid for the EXCHANGE movement only.)
— ODOMETER #	Move number in which the error occurred.
— *MICROMOVE 1 #	First jukebox micro-move for the original move command issued prior to the failure.
— *MICROMOVE 2 #	Second jukebox micro-move for the original move command issued prior to the failure.
— *MICROMOVE 3 #	Third jukebox micro-move for the original move command issued prior to the failure.
— *MICROMOVE 4 #	Fourth jukebox micro-move for the original move command issued prior to the failure.
— *MICROMOVE 5 #	Fifth jukebox micro-move for the original move command issued prior to the failure.
— *MICROMOVE 6 #	Sixth jukebox micro-move for the original move command issued prior to the failure. (This is the last to be logged.)
■ *MICROMOVE ER #	Micro-move error that occurred.

Running an internal test

READY > ADMIN* >TEST*

This section describes self-diagnostic tests that are available on the jukebox.

⚠ **Caution:** If not properly completed, some of the internal diagnostic tests can change the location and orientation of your media within the library. This may prevent software from finding media that is no longer in the expected location.

1. With `READY` displaying on the control panel, press **NEXT** until `ADMIN*` displays.
2. Enter the administration password (see the *User's Guide* if needed).
3. `TEST*` displays. Press **ENTER**.
4. Press **NEXT** until the name of the test you want to run displays, then press **ENTER** to start the test.

Note: You may press **CANCEL** at any time to abort a test. A delay might occur while the current test loop completes.

Table 4: Internal tests

Test Name	Description
EXCHANGE DEMO	*Used by service personnel only. Do not run this test if the jukebox contains disks with file system data on them.* This test moves randomly-chosen optical disks to random storage slot locations. This test displays `FAIL` it there are no disks in the jukebox or if all storage slots are full. For best results, the jukebox should contain as many disks as there are drives, plus two additional disks. The transport and mailslot must be empty.
INIT MECHANICS	Runs the `FIND PLUNGE HOME`, `FIND XLATE HOME`, and `INIT ELEM STATUS` tests. Each test is run one time per test loop.
INIT ELEM STATUS	Physically scans the entire unit to determine which storage slots contain disks and if the drives contain disks. This test appears as `ISTAT TEST` in all control panel error messages.
MAGAZINE IO	Makes a combination of moves with a `PASS/FAIL` result. It moves an optical disk from a randomly-chosen full slot to a randomly-chosen empty slot with a random flip. It then moves the disk back to its original storage slot with its original orientation. This test displays `FAIL` if there are no disks in the jukebox or if all storage slots are full. The drives and mailslot must be empty.
MAILSLOT IO	Makes a combination of moves with a `PASS/FAIL` result. It moves an optical disk from the lowest-numbered full slot to the mailslot with a random flip. It then moves the cartridge back to its original slot with its original orientation. This test displays `FAIL` if there are no disks in the jukebox or if all storage slots are full. The drives and mailslot must be empty.
TRANSLATE TEST	Moves the disk transport mechanism from side to side. No disks are required.

Table 4: Internal tests (Continued)

Test Name	Description
FLIP TEST	Makes a combination of moves with a PASS/FAIL result. Flips the disk transport mechanism at various locations. No disks are required.
PICKER TEST	Tests the plunge motion of the picker.
FIND PLUNGE HOME	Calibrates the disk transport mechanism, establishes the mechanism's orientation, and determines the reference points in the picker travel path. Assumes that the mechanics and servo system are functional. No disks are required.
FIND XLATE HOME	Calibrates the reference points for the side-to-side motion of the disk transport mechanism. No disks are required.
EMPTY DRIVES	*Used by service personnel only. Do not run this test if the jukebox contains disks with file system data on them.* Moves disks out of the drive mechanism(s) and returns them to their home storage slot locations if the locations are known. If the home storage location is not known, the jukebox moves the disks into the first available empty storage slot.
EMPTY PICKER	Moves a disk from the disk transport mechanism to its home storage slot location if that location is known, otherwise the disk is placed into the first available empty storage slot.
FILL PICKER	*Used by service personnel only. Do not run this test if the jukebox contains disks with file system data on them.* Moves a disk into the disk transport mechanism from the first storage slot containing a disk.
EXERCISE MECH	Runs the TRANSLATE TEST, FLIP TEST, MAGAZINE IO, DRIVE IO, and MAILSLOT IO tests. Each test runs one time per test loop.
WELLNESS TEST	Checks the general capability of the jukebox. Requires one loaded disk. The drives, transport, and mailslot must be empty. Runs INIT MECHANICS and EXERCISE MECHANICS. Each test runs one time per test loop.
MAILSLOT SENSORS	Displays the current state of the mailslot sensors. If a sensor is not blocked, a "0" is displayed. If a sensor is blocked, an "*" displays. The display automatically updates when the status changes.
STARWARS	The display shows F:0 B:0. Each "0" indicates one of the paths that the disk transport mechanism follows in front of each stack of optical disks. If the path is clear, a "0" displays; if the path is blocked (because of an optical disk that is not inserted fully into its storage slot for example), an "*" displays. This display is automatically updated if the status changes.
FLIPPER SENSORS	Displays the state of the front and back flip sensors. "0" indicates the sensor is not blocked, and "*" indicates it is blocked.
SWING SENSOR	Displays the state of the swing sensor. "0" indicates the sensor is not blocked, and "*" indicates it is blocked.
SHIPPING PARK	Positions the picker so that the shipping screws can be inserted to secure the picker during shipping. Also rotates in the mailslot.

Using HP StorageWorks Library and Tape Tools

HP StorageWorks Library and Tape Tools (L&TT) is a robust diagnostic tool for tape mechanisms, tape automation, magneto-optical and UDO products. L&TT provides functionality for firmware downloads, verification of device operation, maintenance procedures, failure analysis, corrective service actions, and some utility functions. Seamless integration is provided with HP's hardware support organization through generating and emailing support tickets. The support ticket delivers a snapshot, or an in-depth view, of the storage system.

L&TT is a free download from the Web and deploys in fewer than five minutes. It is ideal for customers who want ensured product reliability, self-diagnostics, and faster resolution of device issues.

For more information, visit http://www.hp.com/support/tapetools.
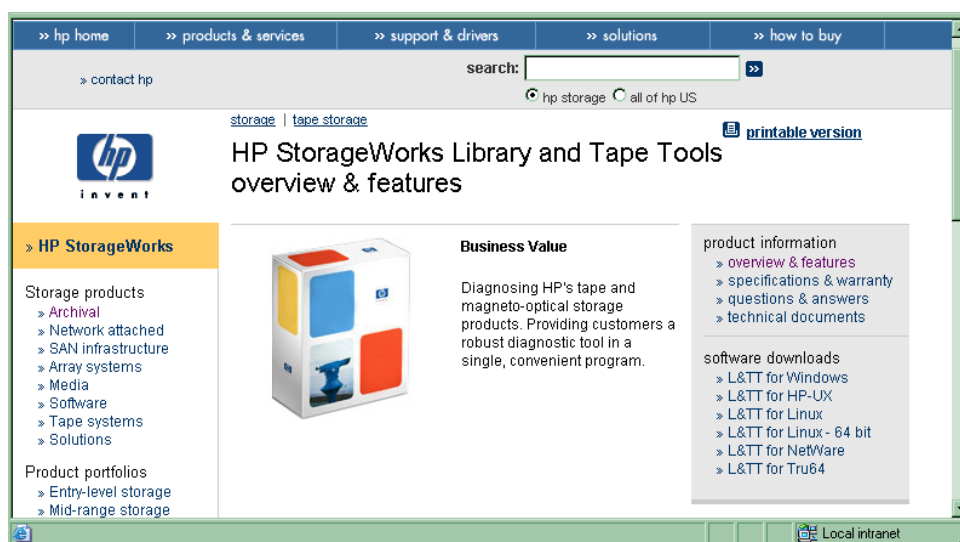
Figure 1: HP StorageWorks L&TT

Service Preparation

2

This chapter provides information on the following:

Protecting yourself and the product

⚠️ **WARNING:** *Do not disassemble the optical drive mechanism.* The optical drive mechanism becomes a Class 3B laser device when disassembled. If the drive is disassembled, exposure to the invisible laser beam and hazardous invisible laser radiation could result in blindness.

Note: An optical drive that has been disassembled will not be accepted as an exchange assembly.

Electrostatic discharge (ESD) precautions

The optical disk jukebox contains very sensitive electrical components. It is *extremely important* that you follow the proper procedures for preventing ESD (Electrostatic Discharge). Use wrist-grounding straps, anti-static mats, and anti-static work stations when removing and replacing the major assemblies.

Note: Failure to follow proper procedures could lead to intermittent failures and/or premature hard failures in the jukebox controller and mechanism.

Required tools

The following tools are needed for assembly/disassembly of the jukebox:

- T-10 Torx® driver

Note: L&TT is the tool to use when firmware upgrades are necessary. See Using HP StorageWorks Library and Tape Tools, page 22 for more information.

Service access for 700ux/1100ux models

⚠ **Caution:** Do not switch off power to the jukebox until you are sure the SCSI bus is *inactive*. Switching off the jukebox when the SCSI bus is active can cause data loss and/or indeterminate bus states.

⚠ **WARNING:** To prevent possible electric shock, disconnect the power cord before taking the jukebox apart.

⚠ **Caution:** When servicing the jukebox, be sure that disk cartridges are not moved from their original slot locations. If you need to remove the cartridges, record their slot locations and orientation so they can be replaced to their original positions.

Removing and replacing an optical drive

The following describes the procedure for removing and replacing an optical drive in the 700ux/1100ux Optical Jukebox.

Note: Before replacing a drive, obtain the most current version of the jukebox controller and drive firmware for the model and option of the jukebox you are servicing.

Note: Online drive repair is not supported.

To remove and replace an optical drive:

1. Power off the jukebox.

2. Remove the two Torx screws that secure the top panel to the jukebox and lift the top panel off the unit (see Figure 2).
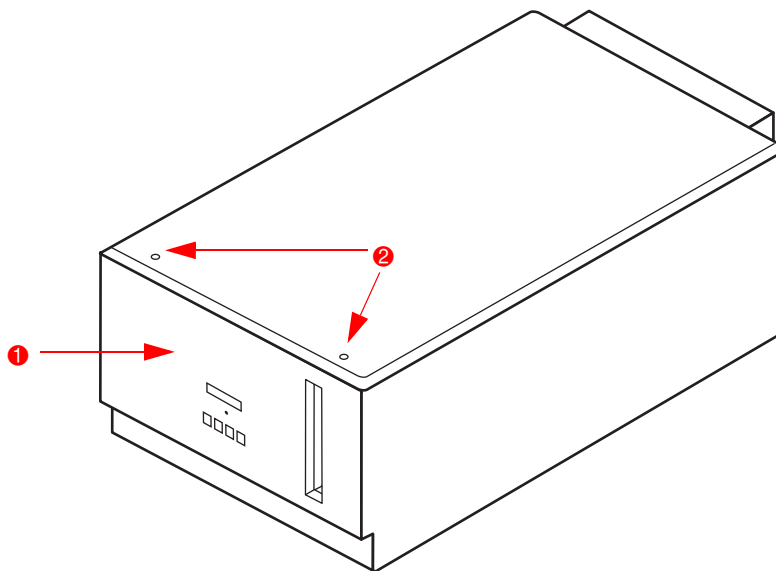
| ❶ | Jukebox front | ❷ | Screws securing top panel |

Figure 2: Remove screws that secure the top panel to the jukebox

3. Identify the failed drive and remove the two T-10 Torx screws that secure the drive's rails to the jukebox frame (see Figure 3) on either side of the drive.
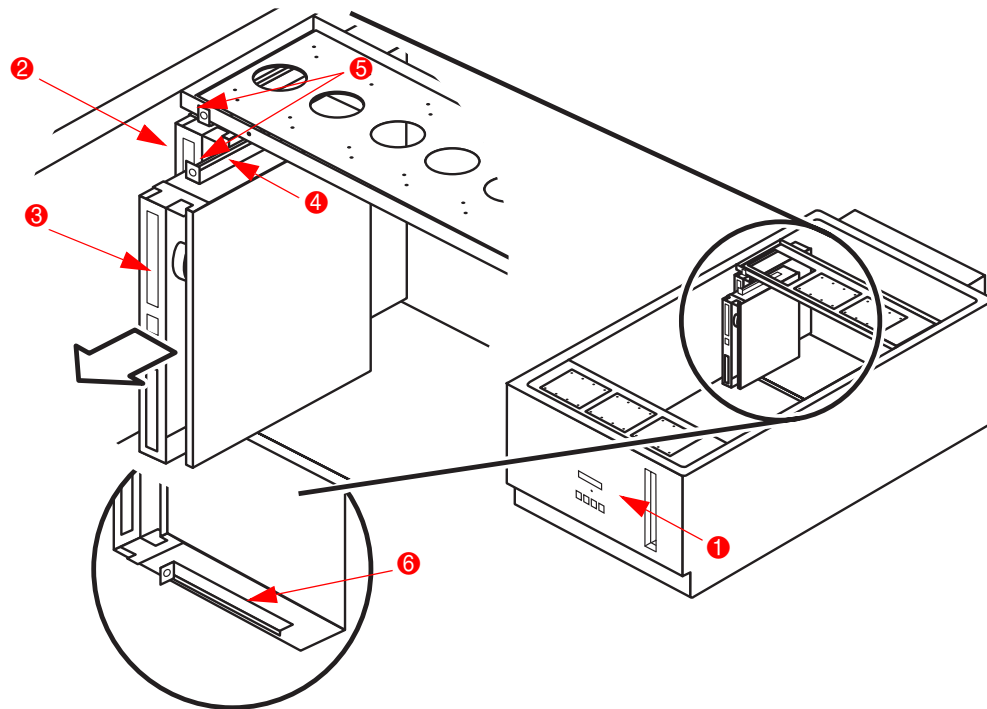

❶	Jukebox front	❹	Drive rail (top side)
❷	Drive 1	❺	Screws that secure drive rail to jukebox (top side)
❸	Drive 2	❻	Drive rail (bottom side)

Figure 3: Remove screws that secure drive rails to jukebox (the right side of the drive is shown)

4. Slide the drive two inches toward the front of the jukebox, so that you have room to disconnect the cables from the drive.

5. Disconnect the cables from the drive.

6. Slide the drive out of the jukebox.

7. Remove the two T-10 Torx screws securing the rails to the drive, one rail on each side of the drive (see Figure 4).
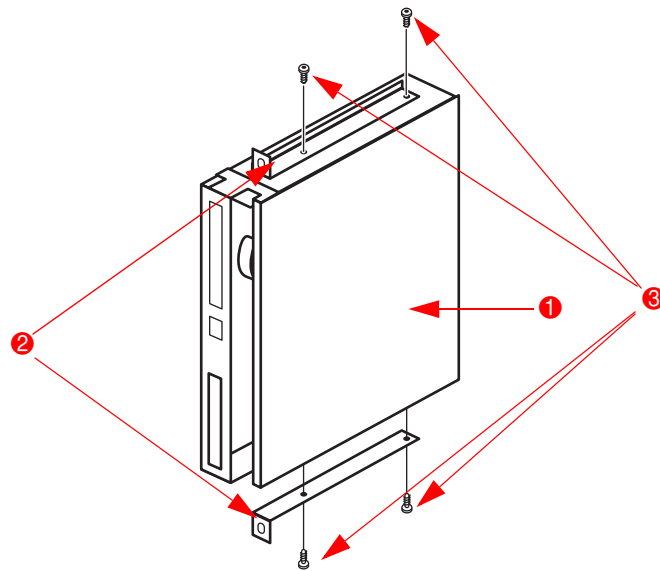
❶	Drive	❸	Screws securing rails to drive
❷	Drive rails		

Figure 4: Remove the drive rails (the rail on the right side of the drive is shown)

8. Remove the rails from the drive.

9. Attach the rails to the replacement drive, using two T-10 Torx screws previously removed.

Note: No specific alignment or adjustment of the bracket is needed.

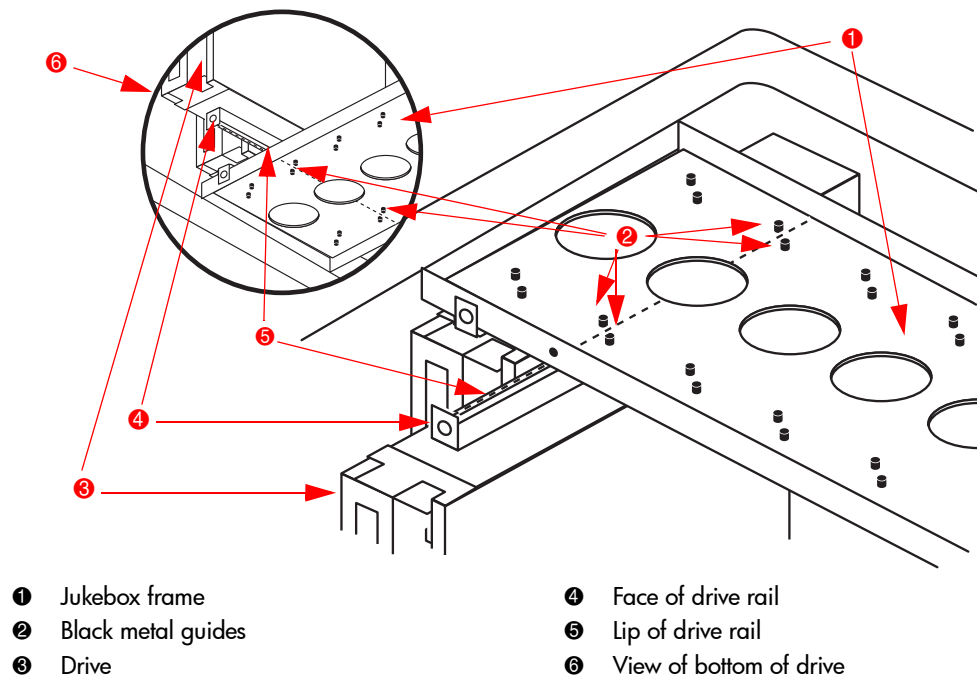10. Align the lip of each rail with the two black metal guides in the jukebox frame (see Figure 5).

❶	Jukebox frame	❹	Face of drive rail
❷	Black metal guides	❺	Lip of drive rail
❸	Drive	❻	View of bottom of drive

Figure 5: Align the drive in the jukebox

11. Partially insert the drive into the jukebox.

12. Connect the cables to the drive (see Figure 6):

    a. Connect the drive interface ribbon cable (the smaller of the two ribbon cables) to the drive.

    b. Connect the SCSI cable (the larger of the two ribbon cables) to the 68-pin connector.

    c. Connect the power cable to the drive.

Note: Connect the left-most drive interface cable on the jukebox controller board to the left-most drive, and the right-most drive interface cable on the jukebox controller board to the right-most drive.

❶	Back of drive	❺	Power cable
❷	Slot for power cable	❻	SCSI cable
❸	Slot for SCSI cable (68-pin connector)	❼	Drive interface ribbon cable
❹	Slot for drive interface ribbon cable		
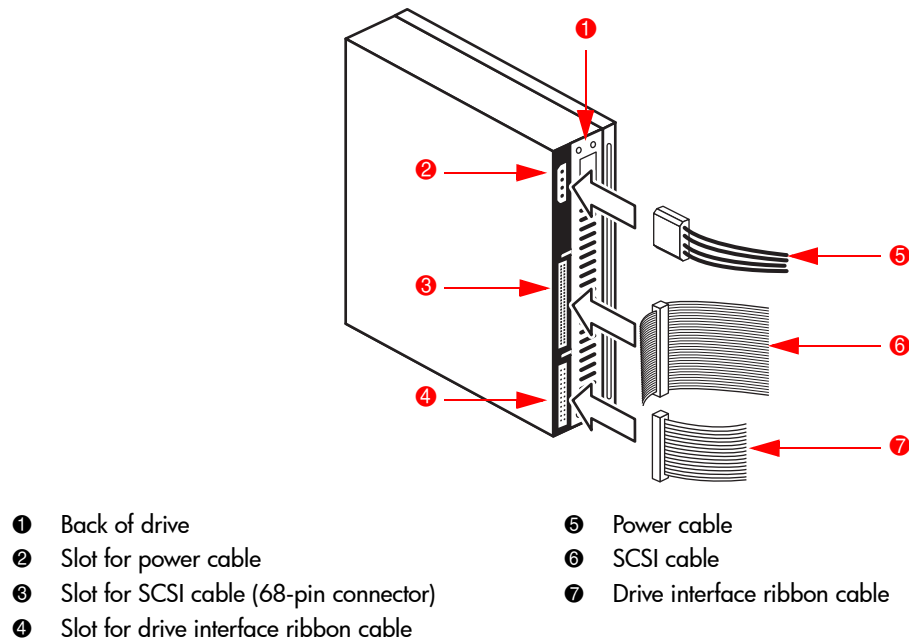
Figure 6: Connect the cables to the drive

13. Slide the drive all the way into the jukebox so that the faces of the drive rails meet the jukebox frame.

14. Secure the drive rails to the jukebox frame using two T-10 Torx screws (see Figure 3).

15. Place the top panel on the jukebox and secure it using the two T-10 Torx screws removed in step 2.

16. Power on the jukebox.

17. Calibrate the picker.

    a. If there is not a cartridge in slot 1 (SCSI element 31) use the LOAD* menu to load a cartridge to that slot.

    b. If necessary, press **CANCEL** to get to the READY mode.

    c. Hold down the **ENTER** button and press **PREV** and **NEXT** so that all three are pressed at the same time.

    d. When <<MAINTENANCE>> PASSWORD>> displays, release the buttons.

    e. Press **ENTER**, **ENTER**, **NEXT**.

    f. Use **NEXT** or **PREV** to go to menu item 36: AUTO SLOT SET, then press **ENTER**.

g. When `AUTO ADJUST TARGET : SLOT` displays, press **NEXT** until `DRIVE` displays, then press **ENTER**.

h. Wait until `36: AUTO SLOT SET` displays. The calibration can take up to 10 minutes.

i. Press **NEXT** to go to menu item `37: AUTO PUSH SET`, then press **ENTER**.

j. When `AUTO PUSH ADJUST : SLOT` displays, press **NEXT** until `DRIVE` displays, then press **ENTER**.

k. Wait until `37: AUTO PUSH SET` displays. This calibration will take about 1 minute.

l. Press **CANCEL** until `ON LINE MODE?` displays.

m. Press **ENTER**.

18. Verify that the new drive is recognized. Use L&TT, or from the front panel:

a. Press **NEXT** to display `ADMIN*`, then press **ENTER**.

b. Enter the password using **PREV** and **NEXT**, then press **ENTER**.

c. Press **NEXT** to display `INFO*`, then press **ENTER**.

d. Press **NEXT** to display `JUKEBOX*`, then press **ENTER**.

e. Press **NEXT** to display `DRIVES #`, with the number indicating how many drives are recognized (1 or 2).

19. Update the drive firmware using L&TT.

Installing an optical drive

The following describes the procedure for upgrading from one optical drive to two optical drives in the 700ux/1100ux Optical Jukebox.

Note: Before installing a new drive, obtain the most current version of the jukebox controller and drive firmware for the model and option of the jukebox you are servicing.

Note: Online drive repair is not supported.

To install a second optical drive:

1. Power off the jukebox.
2. Remove the two T-10 Torx screws that secure the top panel to the jukebox and lift the top panel off the unit.
3. Attach the rails (shipped with the kit) to the new drive, using two T-10 Torx screws (see Figure 7).
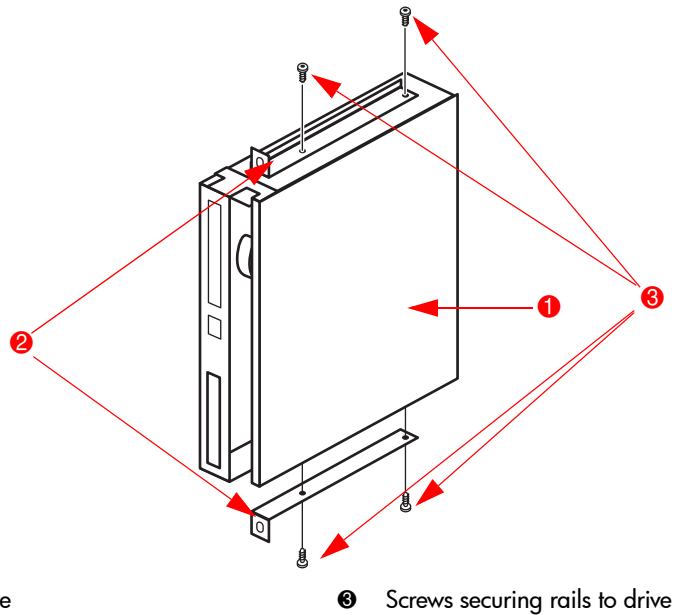
❶	Right side of drive	❸	Screws securing rails to drive
❷	Drive rails		

Figure 7: Attach drive rails to the drive (right side of the drive is shown)

4. Align the lip of each rail with the two sets (one on the top of the frame, one on the bottom) of two black metal guides in the jukebox frame (see Figure 8).
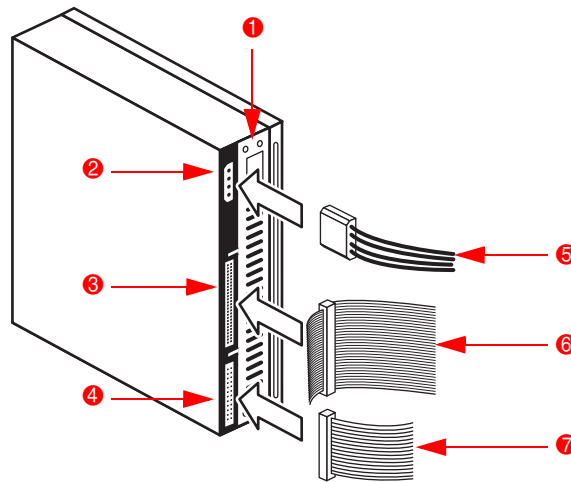

❶	Jukebox frame	❹	Face of drive rail
❷	Black metal guides	❺	Lip of drive rail
❸	Drive	❻	View of bottom of drive
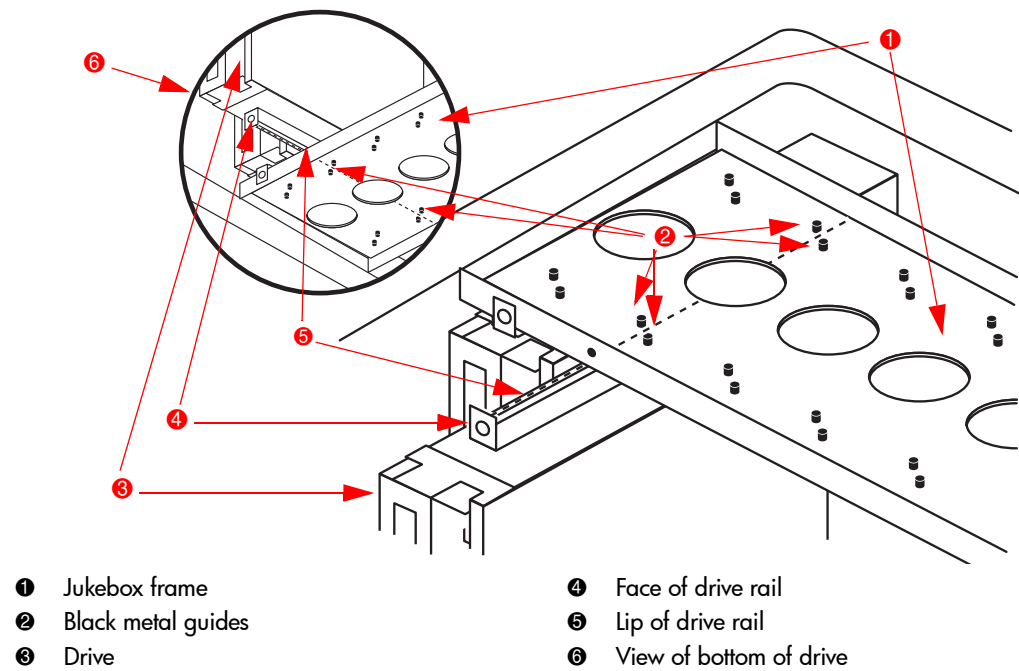
Figure 8: Align the drive in the jukebox

5. Partially insert the drive into the jukebox.

6. Connect the cables to the drive (see Figure 9):

   a. Connect the drive interface ribbon cable (the smaller of the two ribbon cables) to the drive.

   b. Connect the SCSI cable (the larger of the two ribbon cables) to the 68-pin converter.

   c. Connect the power cable to the drive.

Note: Connect the left-most drive interface cable on the jukebox controller board to the left-most drive, and the right-most drive interface cable on the jukebox controller board to the right-most drive.

❶	Back of drive	❺	Power cable
❷	Slot for power cable	❻	SCSI cable
❸	Slot for SCSI cable (68-pin connector)	❼	Drive interface ribbon cable
❹	Slot for drive interface ribbon cable		

Figure 9: Connect the cables to the drive

7. Slide the drive all the way into the jukebox so that the faces of the drive rails meet the jukebox frame.

8. Secure the drive rails to the jukebox frame using two T-10 Torx screws (see Figure 10).
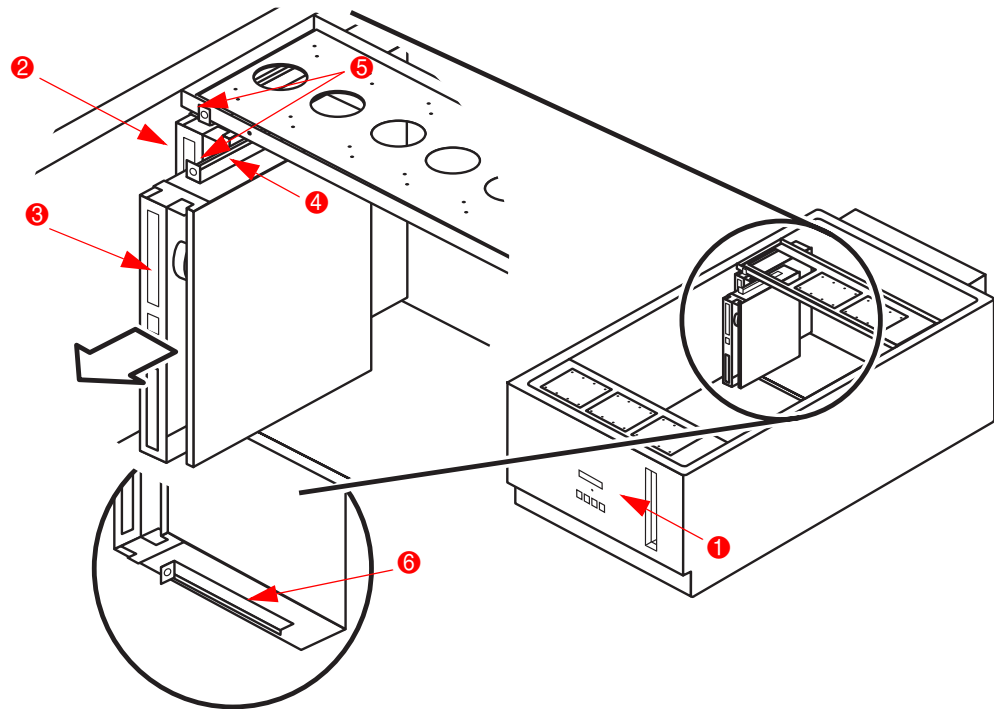
❶	Jukebox front	❹	Drive rail (top side)
❷	Drive 1	❺	Screws that secure drive rail to jukebox (top side)
❸	Drive 2	❻	Drive rail (bottom side)

**Figure 10: Install screws that secure drive rails to jukebox**

9. Place the top panel on the jukebox and secure it using the two T-10 Torx screws removed in step 2.

10. Power on the jukebox.

11. Calibrate the picker.

   a. If there is not a cartridge in slot 1 (SCSI element 31) use the `LOAD*` menu to load a cartridge to that slot.

   b. If necessary, press **CANCEL** to get to the `READY` mode.

   c. Hold down the **ENTER** button and press **PREV** and **NEXT** so that all three are pressed at the same time.

   d. When `<<MAINTENANCE>> PASSWORD>>` displays, release the buttons.

   e. Press **ENTER**, **ENTER**, **NEXT**.

   f. Use **NEXT** or **PREV** to go to menu item `36: AUTO SLOT SET`, then press **ENTER**.

   g. When `AUTO ADJUST TARGET : SLOT` displays, press **NEXT** until `DRIVE` displays, then press **ENTER**.

   h. Wait until `36: AUTO SLOT SET` displays. The calibration can take up to 10 minutes.

   i. Press **NEXT** to go to menu item `37: AUTO PUSH SET`, then press **ENTER**.

  j. When `AUTO PUSH ADJUST : SLOT` displays, press **NEXT** until `DRIVE` displays, then press **ENTER**.

  k. Wait until `37: AUTO PUSH SET` displays. This calibration will take about 1 minute.

  l. Press **CANCEL** until `ON LINE MODE?` displays.

  m. Press **ENTER**.

12. Verify that the new drive is recognized. Use L&TT, or from the front panel:

  a. Press **NEXT** to display `ADMIN*`, then press **ENTER**.

  b. Enter the password using **PREV** and **NEXT**, then press **ENTER**.

  c. Press **NEXT** to display `INFO*`, then press **ENTER**.

  d. Press **NEXT** to display `JUKEBOX*`, then press **ENTER**.

  e. Press **NEXT** to display `DRIVES #`, with the number indicating how many drives are recognized (1 or 2).

13. Update the drive firmware using L&TT.

Installing or replacing the slot configuration module

Installing a slot configuration module configures the jukebox for 38 slots, instead of the standard 24 slots.

1. Power off the unit.

2. Locate the configuration module access door, below the power supply on the back of the jukebox.

3. Remove the two T-10 Torx screws from the configuration module access door (see Figure 11).
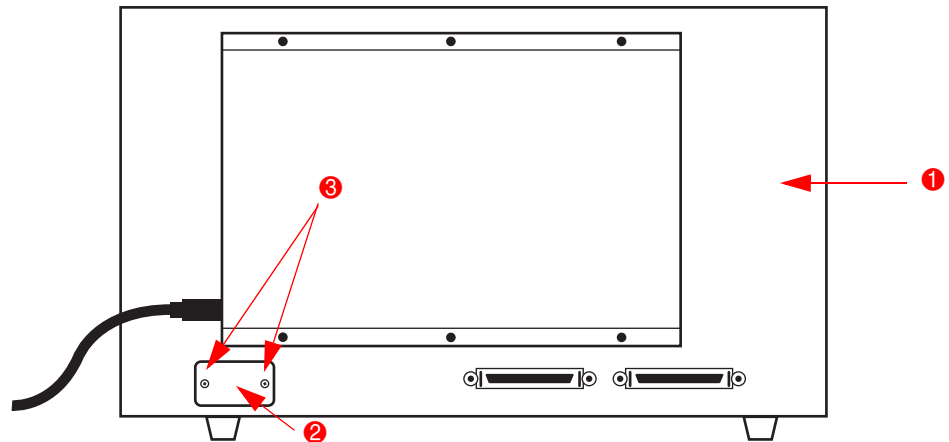
❶	Back of jukebox	❸	Screws securing configuration module access door
❷	Configuration module access door		

Figure 11: Access the configuration module

4. If you are replacing an existing slot configuration module, remove it from the jukebox.

5. Align the configuration module with the guides in the jukebox frame and push the new slot configuration module into the drive until it is securely in place (see Figure 12).
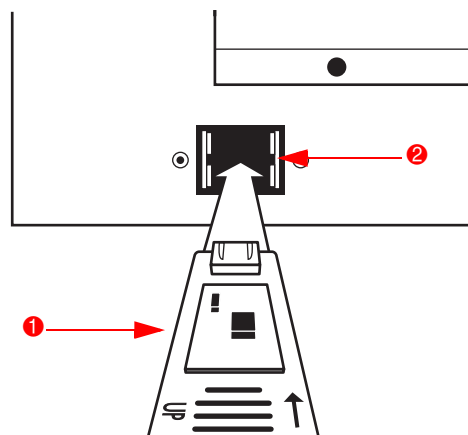
❶	Configuration module	❷	Slot for configuration module

Figure 12: Insert the slot configuration module

6. Replace the access door using the T-10 Torx screws.

7. Power up the unit.

8. From the front panel, verify that slots 25-38 are recognized:

   a. Press **NEXT** to display ADMIN*, then press **ENTER**.

   b. Enter the password using **PREV** and **NEXT**, then press **ENTER**.

   c. Press **NEXT** to display INFO*, then press **ENTER**.

   d. Press **NEXT** to display JUKEBOX*, then press **ENTER**.

   e. Press **NEXT** to display SLOTS ##, with the numbers indicating how many slots are recognized (24 or 38).

Replacing the jukebox

1. Power off the jukebox to be replaced.

2. If the jukebox is in a rack, remove it from the rack. Refer to the *HP StorageWorks 700ux/1100ux Optical Rack Mount Installation* poster, part number AD505-96001, for more information.

3. Remove the two T-10 Torx screws that secure the top panel to the jukebox and lift the top panel off the jukebox (see Figure 2).

4. Remove the drive(s) from the jukebox to be replaced (the rails do not need to be removed from the drive(s)):

   a. Remove the two T-10 Torx screws that secure the drive's rails to the jukebox frame (see Figure 4) on either side of the drive.

   b. Slide the drive two inches toward the front of the jukebox, so that you have room to disconnect the cables from the drive.

   c. Disconnect the cables from the drive.

   d. Slide the drive out of the jukebox.

5. Note the slot positions of the cartridges, then remove all of the cartridges from the jukebox.

6. Remove the configuration module (if present) from the jukebox (see Installing or replacing the slot configuration module, page 37).

7. Power on the jukebox to be replaced.

8. Run the SHIPPING PARK test to put the picker into shipping position:

   a. From the OCP displaying READY, press the **NEXT** button until you see ADMIN, then press **ENTER**.

   b. Use the **PREV** and **NEXT** buttons to enter the password (default is 000 000 000), then press **ENTER**.

   c. At the TEST menu, use the **PREV** and **NEXT** buttons to select SHIPPING PARK, then press **ENTER**.

d. When the display shows `NUM LOOPS`, press **ENTER**.

`TEST LOOP 1` displays, then `COMPLETED` displays. The picker should be all the way to the left of the jukebox, with its two PEMs (see Figure 13) aligned with the shipping screw holes. See step 10 for the location of the shipping screws holes.
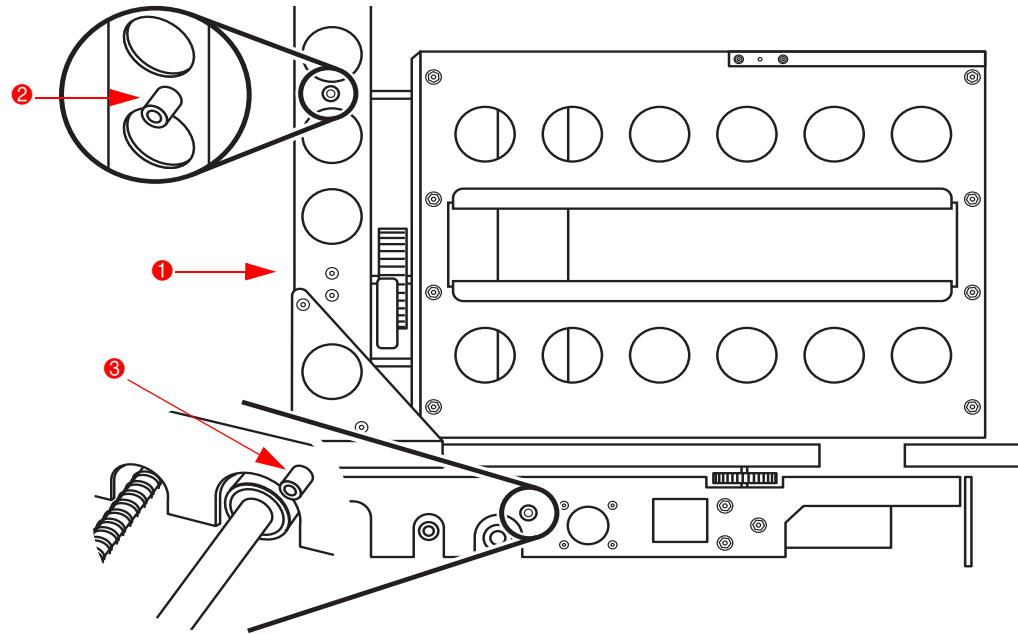
❶   Picker (shown from left side)   ❸   Lower PEM
❷   Upper PEM

Figure 13: Locate the PEMs on the left side of the picker

Note: If the SHIPPING PARK test can not be run or completed, move the picker to the shipping position by hand. Use the latch (see Figure 14), if necessary, to rotate the picker so that the PEMs are in the correct position to align with the shipping screw holes on the left of the jukebox. Then, gently push the picker against the left side of the jukebox frame.
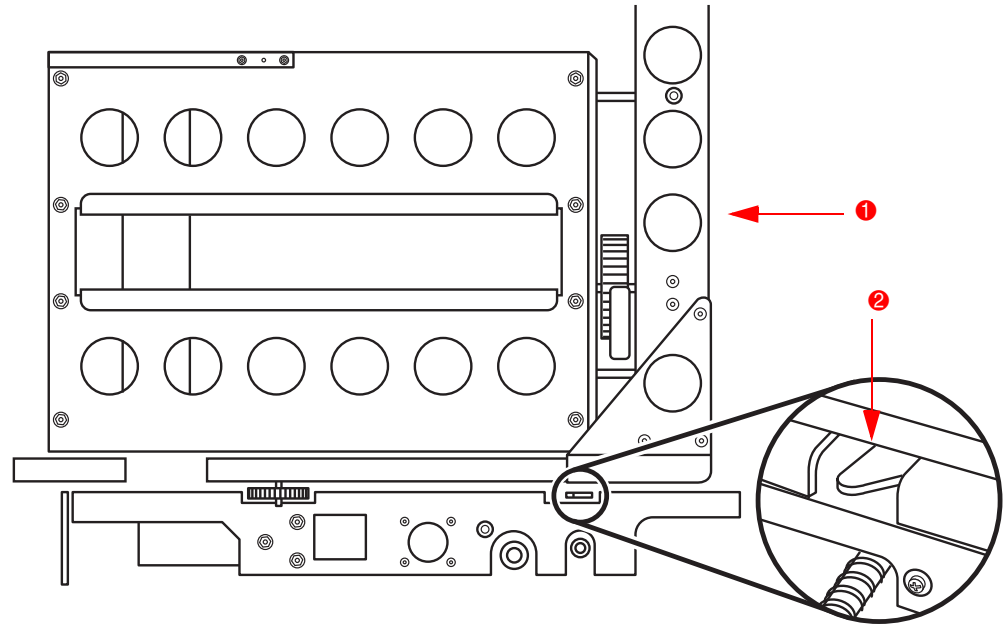
❶   Picker (shown from the right side)   ❷   Release latch to rotate picker

Figure 14: Use the release latch to rotate the picker by hand

9. Power off the jukebox.

10. Install the shipping screws (see Figure 15):

    a. Remove the two black, rubber plugs from the shipping screw holes on the left side of the jukebox.

    a. Remove the two white shipping screws from the storage holes on the back of the jukebox. If these are not present, use the shipping screws from the replacement jukebox.

    b. Insert the shipping screws into the shipping screw holes.

    c. Insert the rubber plugs into the storage holes.

❶ Black, rubber plugs   ❸ Shipping screw holes
❷ Storage holes   ❹ Shipping screws
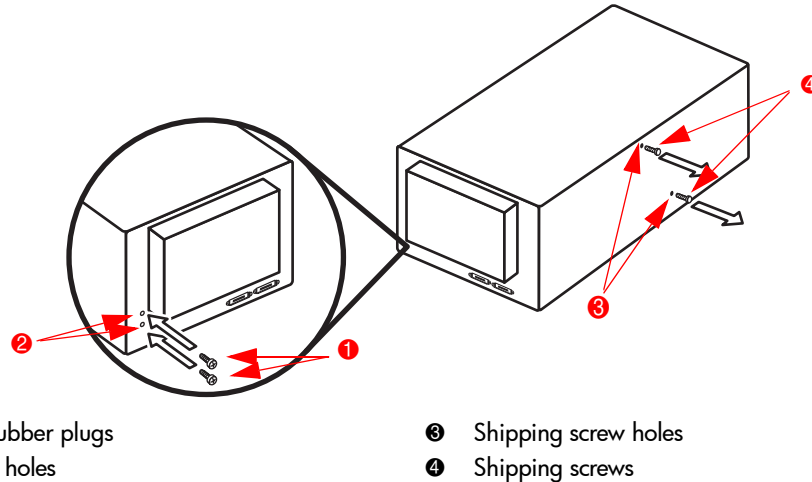
Figure 15: Install the shipping screws

11. Secure the top panel to the jukebox using two T-10 Torx screws.

12. Remove the shipping screws and the top panel from the replacement jukebox.

13. Install the drives from the old jukebox into the new jukebox (see Installing an optical drive, page 32).

14. If there is a configuration module, install it in the new jukebox (see Installing or replacing the slot configuration module, page 37).

15. Power on the new jukebox.

16. Calibrate the picker.

    a. If there is not a cartridge in slot 1 (SCSI element 31) use the LOAD* menu to load a cartridge to that slot.

    b. If necessary, press **CANCEL** to get to the READY mode.

    c. Hold down the **ENTER** button and press **PREV** and **NEXT** so that all three are pressed at the same time.

    d. When <<MAINTENANCE>> PASSWORD>> displays, release the buttons.

    e. Press **ENTER**, **ENTER**, **NEXT**.

    f. Use **NEXT** or **PREV** to go to menu item 36: AUTO SLOT SET, then press **ENTER**.

    g. When AUTO ADJUST TARGET : SLOT displays, press **NEXT** until DRIVE displays, then press **ENTER**.

    h. Wait until 36: AUTO SLOT SET displays. The calibration can take up to 10 minutes.

      i.   Press **NEXT** to go to menu item `37: AUTO PUSH SET`, then press **ENTER**.

      j.   When `AUTO PUSH ADJUST : SLOT` displays, press **NEXT** until `DRIVE` displays, then press **ENTER**.

      k.   Wait until `37: AUTO PUSH SET` displays. This calibration will take about 1 minute.

      l.   Press **CANCEL** until `ON LINE MODE?` displays.

      m. Press **ENTER**.

17. Use the mail slot to load the cartridges into the new jukebox, in the same slot positions as they were in the old jukebox.

    Loading the cartridges with the mail slot tests the functionality of the robotics, and verifies that the correct number of slots and drives are detected.

18. Replace the top panel and secure it with the two T-10 Torx screws.

19. Download firmware and test with L&TT.

20. Mount the jukebox in the rack, if appropriate.

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